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Performance Based Incentives for Military Recruiters: Evidence from the U.S. Navy

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Abstract:

Economic theory suggests that the use of flat-rate compensation for military recruiters is sub-optimal. We elicited the preferences of U.S. Navy recruiters for a piece-rate compensation scheme, and find many would prefer a modest decrease in fixed salary in exchange for the opportunity to receive a small monetary bonus per high-quality recruit. Under such a bonus scheme, the Navy could hire fewer recruiters and thus lower recruiter personnel expenses by 14.7 percent per year (over $40 million) while maintaining quality standards. Furthermore, survey evidence suggests the current policy of awarding non-monetary compensation for job performance provides minimal incentive to increase output.

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1. Introduction

Recruiting is a vital and a large-scale operation for any all-volunteer military. For example, the U.S. Navy – the focus of our study – employed almost 4,500 recruiting personnel to enlist almost 34,000 new sailors in fiscal year 2014 (Department of the Navy, 2015). Recruiting is also an expensive operation: to acquire these recruits, the Navy spent over $600,000,000, or about $18,000 per recruit.[1] In this paper, we explore whether a new compensation scheme for recruiters can increase efficiency while maintaining the quality of the workforce.

Currently, Navy recruiters are paid a fixed salary and are expected to meet a quota for new enlisted recruits – typically one per month.[2] There is minimal incentive for a recruiter to exceed her quota, as acquiring extra recruits is only compensated (occasionally) with non-monetary awards and commendations. In this environment, those recruiters who have the ability to bring in more recruits may choose not to exert the extra effort. Thus, the Navy may be employing a larger than necessary recruiting force and incurring the associated personnel costs.

Economic theory suggests that the use of contracts that align incentives between the principal and an agent has the potential to increase efficiency. In our recruiting context, the Navy is the principal and the recruiter is the agent. The difficulty in designing an ideal contract often arises from information asymmetry, in particular, due to moral hazard (Holmstrom, 1979) and adverse selection (Akerlof, 1970). Contract structure typically varies by the type of task and the ability of the principle to verify effort, but any optimal contract should align the incentives of the agent with the objective of the principle and motivate the agent to exert the correct amount of effort for the given task (Milgrom and Roberts, 1992). As exerting effort is costly, it makes little economic sense to pay agents a flat rate independent of effort level or output. Rather, it would be an improvement to use a piece-rate compensation scheme, such as what is used for sales

[1] In 2014, the operations and maintenance (O&M) budget for recruiting and advertising was $230.95 million. Personnel costs can be approximated at $373.63 million ($83,029 for each of the 4,500 recruiting personnel, see section 4.3 below for details).

[2] We focus on the recruitment of enlisted sailors. Recruitment of Naval Officers follows very different dynamics, typically achieved through enrollment in the U.S. Naval Academy or the Reserve Officers' Training Corp at a civilian university.

agents in the form of a commission tied to output.[3] While we are not developing an optimal compensation method, piece-rate compensation is a good first candidate to consider, for several reasons: recruiting duties have output that is easy to measure, recruiters have high value in the alternative use of their time, the cost of monitoring effort is high, hours spent working are not an informative measure of production, and the cost of evaluating quality is low (Lazear 1986; Fama 1991). Empirical evidence from similar contexts to recruiting shows that piece-rate compensation can have dramatic effects on output, for example by increasing productivity by 44% when compared to hourly wage (Lazear 2000), by 20% when compared to fixed wage (Shearer 2004), or by 50% when compared to relative incentives (Baniera, Barankay, Rasul 2005)

Previous efforts to improve military recruiter productivity in the U.S. have had limited success (Asch, 1990). Furthermore, there is no empirical evidence to date on the desirability or cost-effectiveness of a piece-rate compensation scheme in military recruiting.[4] We present evidence suggesting that if the U.S. Navy moved from flat-rate compensation (a straight salary) to the use of a simple piece-rate compensation scheme (salary plus per-recruit bonus) it could significantly improve recruiter productivity and save the U.S. Navy millions of dollars. Importantly, as some may be opposed to the use of monetary bonuses in military recruiting, we also present evidence that a non-monetary piece-rate bonus – such as time-off – could have a similar incentivizing effect.

In particular, we conducted a survey of U.S. Navy recruiters to elicit their preferences for a piece-rate compensation scheme under which they would receive a bonus per signed recruiting contract. In order to accurately reveal preferences, we phrased the alternatives in the form "*Would you rather keep your current salary or have your monthly salary reduced by $200 and receive X per high quality recruit contract you sign?*" where X starts at $50 and rises to $300 sequentially if a lower bonus amount is not preferred. Under minimal assumptions on preferences, a stated preference for the piece-rate compensation scheme reveals to us a lower bound on recruiters' beliefs about their labor productivity under the scheme.

[3] Piece-rate compensation is also known as linear compensation. It includes both pure piece-rate compensation and piece-rate compensation supplemented by a fixed-rate component (a salary).
[4] See Lyons and Riester (1993) for a theoretical analysis of an optimal recruiter bonus incentive scheme.

We find that 14.4% of recruiters prefer to have a piece-rate compensation of $50 (with a $200 reduction in salary) over the status quo of flat-rate compensation, which implies (under minimal assumptions) that these recruiters believe they are capable of signing at least 4 contracts per month (4 recruits at $50 each would break even with the status quo). A more productive recruiting force implies that the Navy could hire fewer recruiters: using conservative assumptions about the productivity of recruiters under a piece-rate compensation scheme, and given that the average cost of a recruiter to the Navy in salary and benefits alone is almost $7,000 per month (see section 4.3 below), we find that the Navy can save approximately $94 million per year under this $50-per-contract bonus (a 28% decrease in personnel costs). If the bonus were higher, savings would be even larger: cumulatively, we find that 52% of recruiters prefer the alternative with a piece-rate bonus of $150 per recruit which implies savings of well over $100 million per year (a 50% decrease in personnel costs).

We also asked recruiters and their managers (the "leadership positions") whether they believe the current policy of using non-monetary awards and commendations incentives increase recruiter effort beyond one's quota. Recruiters are generally not motivated by these awards, yet managers have a much stronger belief that awards indeed motivate recruiter effort. Interestingly, both recruiters and managers agree that time off is a strong motivator for increased recruiter output.

This research is related to the broader literature on military compensation, which increasingly is concerned with aligning the incentives of military personnel with organizational goals (Savych, 2005; Arkes and Cunha, 2015). Furthermore, while our research focuses on the U.S. Navy, we believe these results are externally valid for the other branches of the U.S. military and for other countries that must recruit their armed forces.

This paper proceeds as follows: In Section 2, we provide details of the recruiting environment of the U.S. Navy. Section 3 describes our survey methodology and sample. Section 4 presents our analysis and results, and Section 5 concludes.

2 Recruiting in the U.S. Navy

2.1 Organizational structure and quotas

The U.S. Navy Recruiting Command (NRC) is tasked with recruiting the personnel that the Navy requires to fulfill its mission. NRC is divided into 26 Navy Recruiting Districts (NRD), which are subdivided into 985 Navy Recruiting Stations (NRS). There are currently approximately 4,500 Navy recruiters, and the spread of recruiters across stations is determined by various factors such as population density, potential recruits, and market demographics.

The majority of Navy recruiters (85 percent, or 3825 recruiters) are sailors who come to NRC as a short (typically three-year) temporary assignment away from their normal job. The Navy believes that these "production recruiters" can attract more, and better, recruits given their recent experience in various non-recruiting related Navy jobs. The remaining 15 percent of recruiters have made recruiting their career, and they help train production recruiters as well as manage their own recruiting duties.

NRC sets overall recruiting targets in terms of both number and type of recruits, and these quotas are allocated in turn to NRDs, NRSs, and individual recruiters.[5] Individual recruiters typically have a quota of one "net" recruit per month, where "net" contracts are the number signed minus the number of recruits who drop out of the "waiting to ship" status (i.e., the Delayed Entry Program, or DEP). That is, recruiters do not get credit for individuals who sign up but do not ultimately join the Navy. The Navy has specific quotas for diversity (gender and ethnicity), certain occupations in the Navy (for example, those qualified to perform high-skilled nuclear engineering work), educational attainment (high school degree holders), and intellectual ability as measured by the Armed Forces Qualifying Test (AFQT).[6] "High quality" recruits are defined as those with a high school diploma (or still in high school on track to earn a diploma) and with an AFQT score above 50—AFQT scores reflect percentiles from the national distribution of 18-23 year olds. In recent years, the Navy has allowed only a small

[5] See Pinelis el at.. (2011) for more detail on how the requirements are distributed to the NRD and its subordinate units.

[6] Education and ability quotas are intended to prevent recruiters from simply recruiting low quality, easier-to-obtain, recruits.

fraction of recruits to be non-high-quality and they are easier to recruit, and so in our survey we focus only on high-quality recruits.

2.2 Compensation and Incentives

Recruiters' base salaries are determined solely by their rank and years of service, exactly as in any other assignment in the military. On top of the base salary, all recruiters also receive a fixed rate monthly bonus of $450 – known as Special Duty Assignment Pay (SDAP) – which is a compensating differential paid to the recruiters for the difficulty of the assignment.[7] Importantly, recruiters are not compensated by piece rate for the number of recruits they sign.

NRC does use several non-monetary awards in order to acknowledge and incentivize recruiters. In our survey instrument, we categorized the non-monetary incentives in five different groups: Gold Wreath Awards, Other Individual Awards, Station-Level Awards, District-Level Awards, and Extra Liberty (paid time off).

A Gold Wreath is an award specific to the recruiting profession; one is awarded to every active duty recruiter upon completing recruiter training, and recruiters can earn more Gold Wreaths for career milestones. Gold Wreath awards cannot be worn after leaving recruiting duty, and therefore have no impact on future career prospects. As such, they are a low-powered incentive for exerting effort.

Several other non-monetary awards accrue to the individual, including the Navy and Marine Corps Commendation Medal (Commendation Medal), the Navy and Marine Corps Achievement Medal (NAM), Recruiter of the Year and Quarter awards, and awards for achieving milestones in the number of recruits (e.g., the "Heavy-Hitter" award or the "Six-Shooter" award). In contrast to the Gold Wreath Awards, some of these individual-level awards – the Commendation Medal and the NAM in particular - signify outstanding performance and thus can directly impact the recruiter's future advancement opportunities. We thus expect these awards would induce greater effort than the Gold Wreath Award.

[7] SDAP may be taken away if the recruiter is not meeting minimum job requirements, but in practice this rarely, if ever, happens.

Station- and district-level awards recognize the organization as a whole and thus speak less about the individual performance of the recruiter, yet may still generate unit pride and incentivize effort.

Finally, extra liberty (i.e., paid time off) is certainly a motivator for productivity, however the limited ability to grant leave limits its use as an incentivizing mechanism. For example, station-level leadership is only authorized to grant a maximum of 24 hours liberty at a time, usually about once per week.

3. Survey and Sample Population

We designed an online survey that could be taken by both production recruiters and recruiting leadership. The survey was voluntary and followed local IRB protocol. The survey link was distributed electronically in an email from our research team, stating the academic nature of the survey and that we had the full support of Navy Recruiting leadership. The initial solicitation email was sent in January 2013 and follow-up reminders were sent one week and two weeks later. Respondents were given a total of 3 weeks to respond.

NRC required us to receive permission from the 26 individual NRDs. Those granting permission were to provide us with an email distribution list to which we could solicit responses. Of the 26 NRDs, 20 participated in the survey and provided the distribution list. In total, 3,374 individuals were invited to participate in the survey, 76% of which were recruiters and 24% were leadership.

Amongst those who received the survey invitation, 690 consented to participate and 617 completed the survey questions (308 recruiters and 309 leadership). Unfortunately, NRC did not allow us to collect demographic information or the recruiting station/district of respondents, and so we are not able to statistically test whether the respondents are a representative sample of the recruiting population.

4. Results

4.1 Non-monetary incentives

The Navy currently uses several non-monetary incentives to motivate recruiters to exert effort, including awards and extra liberty. We asked recruiters whether these non-

monetary incentives motivated them to obtain one more contract per month, and we also asked those in leadership if they believed the non-monetary incentives motivated recruiters to obtain one more contract per month. The five non-monetary incentives are: Gold Wreath Awards, Other Individual Awards, Station-Level Awards, District-Level Awards, and Extra Liberty.

Figure 1 summarizes these responses from recruiters about themselves (Panel A) and from leadership about recruiters in general (Panel B). Several main points can be seen. First, there is a large variation in beliefs and preferences for all categories between and within recruiters and leadership. This suggests that incentivizing systems should be personalized to be the most effective, which is consistent with previous findings by Coughlan, Gates, and Myung (2014) that one size does not fit all.

Second, it appears that the more likely is an award to impact one's future career prospects, the more likely is that award to motivate a recruiter to obtain one more contract per month. For example, amongst the awards categories, the "Other individual awards" category has the highest percentage of recruiters claiming it "Always" motivates them to obtain one more contract, and the fewest percentage claiming it "Never" motivates them.

Third, the leadership believes that awards are more motivating for increased productivity than do the recruiters themselves. Comparing Panels A and B of Figure 1, the distribution of responses by the leadership are shifted to the right (towards being more motivating) for all four award categories, as well as for extra liberty, compared to the distribution of responses by the recruiters.

The fourth point from Figure 1 is that, for each award category, the majority of the recruiters reported that each of these awards are only sometimes-to-never motivating as an incentive. Even the majority of the leadership answered that all of the awards -- except the other individual awards category -- are "sometimes," "rarely," or "never" motivating for the recruiters to obtain additional recruits. However, the majority of both the recruiters and the leadership believe that extra liberty is often-to-always motivating incentive. In particular, 37% of our sample population reported that the extra-liberty incentive is always motivating. Extra liberty is a more immediate compensation than

other awards, which is generally granted months in the future, and the apparent large motivating effect suggests that monetary compensation may be even more motivating.

4.2 Monetary Incentives

We designed a set of questions to elicit recruiters' preferences for, and potential output under, a piece-rate monetary compensation scheme.[8] If piece-rate compensation can increase productivity per recruiter, the Navy could potentially reduce costs by employing fewer recruiters to meet the recruiting goal.

To elicit true expected productivity, we had the respondents choose between the current compensation system (with their standard SDAP bonus of $450) and a hypothetical piece-rate compensation system where the SDAP bonus is reduced to $250 but is accompanied by a net per-contract bonus for high-quality (HQ) recruits. Formally, this piece-rate compensation is

$$\text{(new SDAP)} + \text{(net \# of HQ recruits)} \times \text{(piece rate per contract)} = \$250 + HQ \times PR$$
$$\text{where } PR \in \{\$50,\$100,\$150,\ldots,\$300\} \quad \text{(EQ 1)}$$

Assuming the recruiters would prefer the new compensation scheme only if they believed they could make up the difference of $200 by obtaining additional recruits, we can infer a minimum level of productivity under various bonuses.

While piece-rate compensation may be able to pay for itself with higher productivity even when keeping the SDAP (fixed) bonus at $450, our survey decreased the SDAP bonus to be less than $450 in order to create an incentive-compatible survey mechanism. For example, if we kept the SDAP bonus at $450, most recruiters would surely prefer the piece-rate compensation, as the recruiters face no downside risk. By reducing the SDAP bonus to be less than $450, the recruiters now faced a trade off between receiving $450 with certainty regardless of production level, or receiving SDAP of less than $450 with a potential to earn more than a total of $450 by increasing

[8] We did not ask these questions of the leadership.

production level. Assuming the recruiters would choose the option that would yield the higher expected total bonus, the recruiters would likely answer honestly and, by doing so, reveal how productive they believe they could be. One drawback from our chosen methodology, however, is that it only elicits a lower bound on expected productivity.[9]

The first question on the bonus had the recruiters choose between these two payment schemes:

(1) The status quo, under which they receive their current flat-rate SDAP bonus of $450 each month.
(2) A new SDAP of $250 each month with a $50 bonus per net high-quality contract.

As discussed above, "net" contracts are the number signed less the number that attrite from DEP (choosing not to report to basic training), and high-quality contracts are individuals who score greater than a 50 on the AFQT and have a high school diploma (or are still in high school and on track to receive a diploma). For parsimony, we imply contracts are "net high-quality" in the discussion below. Assuming that a recruiter is risk-neutral or risk-averse, choosing the piece-rate compensation scheme implies that the recruiter would expect to write at least four contracts per month, which would yield an aggregate bonus ($250 plus four $50 piece-rate bonuses) equal to the status quo flat-rate bonus of $450.[10] If a recruiter were risk-averse, he/she would expect to write even more than four contracts in a month if they selected the piece-rate compensation.

This series of questions ends if the recruiter prefers the $50 piece rate bonus plan. But if the recruiter chooses the status quo (the $450 flat-rate bonus), we offer a choice between the status quo and a new hypothetical bonus scheme that has the same reduced SDAP of $250 but bumps the piece-rate bonus up to $100 per HQ contract. In this scenario, choosing the piece-rate compensation suggests that the recruiter would expect

[9] An alternative elicitation strategy would be to ask recruiters if they prefer a bonus and how productive they would be with the bonus; however, we believe that respondents would tend to overstate expected productivity in response to such questions.

[10] We cannot infer that the recruiter is expecting to write at least four contracts if he is risk seeking. In expected utility theory, a risk seeking person can have an expectation of less than four recruits and still prefer the piece-rate compensation. We make the assumptions that people are generally risk-neutral or risk-averse when it comes to income and that relatively few people are risk seeking.

to write at least two contracts per month. We iteratively raise the piece-rate compensation amount each time the subject chooses the status quo flat-rate SDAP bonus of $450, going to $150, then $200, and finally to $300 per contract bonus. As with the $50 and $100 piece-rate compensation, the choice of any of these larger amounts implies a minimum expected productivity under a piece-rate compensation scheme.

Table 1 shows our main results. Column 2 contains the percent of respondents who indicated that they would take a given piece-rate compensation (EQ 1) over the status quo of a $450 flat bonus; column 3 shows the cumulative percentage; and column 1 shows the minimum expected productivity for recruiters who prefer a given piece-rate compensation system over the status quo.

Of the 308 recruiters in the survey, 14.4% would take the $50 bonus, yet an additional 31% would take the $100 per-contract bonus. Under the assumption that an individual who would prefer piece-rate compensation with lower per-contract bonus rate would still prefer the piece-rate compensation with a higher per-contract bonus, the cumulative percentage is the relevant number for a given bonus amount. A majority of the respondents (52%) preferred receiving a piece-rate compensation of $150 plus a new SDAP of $250.

Notice that once the piece-rate compensation reaches $200, a recruiter only needs to recruit the current typical goal of one recruit per month to break even with the current SDAP bonus of $450: almost 65% of the recruiters preferred this $200 piece-rate compensation to the status quo. Once the bonus rises to $300, almost 80% of recruiters said they would prefer the piece-rate compensation.

4.3 Cost Analysis of Piece-Rate Compensation

Piece-rate compensation is attractive because the Navy could potentially reduce the size of the recruiting force while still meeting the overall recruiting goal. We now present a simple cost analysis of the piece-rate compensation schemes included in our survey, and show that through their use the Navy could realize significant cost savings.

We assume that the Navy must recruit 34,000 HQ sailors per year. This figure approximates the average of the number of HQ recruits in FY 2014 and the planned HQ recruitment goal of in FY 2015. (In the current weak youth labor market, the Navy has

been able to recruit almost exclusively HQ applicants.) We also assume that our sample is representative of the population of recruiters, recruiters responded truthfully to our survey, and that recruiters are risk-neutral. On the latter assumption, risk-averse recruiters would tend to recruit more under a piece-rate scheme (to ensure they make the break-even compensation), which would lead to more cost-savings compared to the status quo.

The major difficulty in this type of exercise arises from the fact that we do not know how recruiters would react to policies they did not prefer (i.e., the option they did not choose). For example, how would recruiters who did not prefer a particular bonus scheme in fact perform under the scheme? How would those who preferred a small piece-rate bonus scheme react to an even larger bonus? In light of this missing information, we invoke the following assumptions, all of which imply cost savings from a piece-rate compensation scheme will be a conservative lower bound.

1. Recruiters who prefer a given piece-rate scheme would recruit the number of sailors needed to break even with the status quo (column 1 of Table 1). This is a very conservative assumption as it precludes those preferring the piece-rate scheme from increasing their income.
2. Recruiters who prefer a given piece-rate scheme would generate the same number of HQ contracts if the bonus increased and not be incentivized to generate more contracts. For example, those who preferred a per-contract bonus of $50 would still generate 4 contracts per month under the $100 per-contract scheme.[11]
3. Recruiters who do not prefer a given piece-rate scheme recruit 0.5 recruits per month. These recruiters are likely less productive in general than those who preferred the piece-rate scheme, and so likely produce less than the Navy-wide average of about 0.75 high-quality recruits per month.

One final assumption we make is less conservative: we assume that recruiters have a good sense of how productive they could be if increasing effort. This expectation would

[11] A higher bonus rate has two effects: (1) it incentives more productivity on the margin (the substitution effect) and (2) it incentives less productivity because income is higher. We assume these two effects cancel out.

incorporate the potential increase in competition with other recruiters when revealing the amount of recruits they could acquire under a bonus scheme.

Table 2 summarizes the cost analysis. First, we consider the personnel requirement. In the status quo of no piece-rate bonus, the Navy currently employs 3,825 to recruit 34,000 sailors per year.[12] Under our $50 piece-rate bonus scheme, an estimated 2806 recruiters would be needed: 14.4% of recruiters would be incentivized to produce 4 recruits per month (404 recruiters generating 19,588 contracts) and the remaining 85.6% produce 0.5 recruits per month (2402 recruiters generating 14,412 contracts).

Under a $100 piece-rate bonus, we estimate that the total number of recruiters needed would decrease to 1931. The most productive 14.4% would still produce 4 recruits per month, but now an additional 31% of recruiters produce 2 recruits per month instead of 0.5 recruits per month. Increasing the piece-rate compensation to $150 per contract shifts the productivity of the next 6.5% of recruiters up to 1.33 recruits per month, causing a further reduction in the number of recruiters needed to 1849.

Thus, the Navy could reduce the production-recruiter force by 27%, 50%, or 52% under piece-rate compensation schemes of $50, $100, or $150, respectively, while still manning the force.

Next, we consider the cost of these various compensation schemes. The personnel cost for the Navy recruitment command includes flat-rate salary and benefits, SDAP payments, and piece-rate bonus payments (under the proposed policies). For simplicity, we use the flat-rate salary and benefits for a sailor of rank E-5, the modal rank of recruiters, which was $83,029 in FY2014. Because recruiters typically do not qualify for the SDAP bonus until the fourth month of recruiting duty and because the typical recruiting tour is 36 months, the annualized SDAP bonus is computed as receiving 11 months of the SDAP bonus.

As Table 2 shows, there are two countervailing effects of switching to a piece-rate bonus scheme: piece-rate bonus payments arise, but are balanced against much lower overall outlays on flat-rate salaries and SDAP payments because there are fewer recruiters.

[12] Recall that Navy currently has 4,500 recruiters, of which approximately 85% are production recruiters.

We use the current environment, column 1, as our benchmark case with total compensation cost of $336.5 million. For the piece rate bonus of $50, the savings from lower personnel costs are 26.6%, or $56 for each $1 awarded in piece-rate bonuses, with net savings of $94.1 million per year. If the piece rate were $100, savings would be 49.9% ($168.7 million), and a $150 piece-rate bonus would lead to 51.7% ($172.8 million) in cost savings. This represents savings of $50 and $34 for each $1 of bonus paid under the piece-rate of $100 and $150, respectively. Interestingly, the saving for each $1 bonus paid is initially high and then decreasing, reflecting a high marginal rate of return when piece rate is low and then a decreasing marginal rate of return (despite greater savings) as the piece rate rises.

One important thing to note is that these savings are large enough that the Navy could implement a piece-rate bonus scheme *without* lowering SDAP payments to $250 per month and still realize significant cost savings. As we show in column 5 of Table 2, a piece-rate bonus of $50 along with the status quo SDAP of $450 will (under our set of assumptions) not change the number of required recruiters or their productivity, but will simply increase aggregate SDAP payments, and thus reduce costs savings. Cost savings relative to the status quo in this scenario are still a very favorable $88 million per year.

5. Conclusion

Economic theory suggests that piece-rate compensation may be optimal in a principal-agent environment, such as that of the U.S. Navy recruiting command. We have provided survey evidence from an incentive-compatible, large-sample survey of U.S. Navy recruiters that suggests that piece-rate compensation can increase productivity and reduce costs. The schemes we study easily pay for themselves, and thus do not require additional funding. We also find that the current system of non-monetary awards are not valued by recruiters and may not be enough to provide incentives.

There is another potential benefit of having piece-rate bonus structure: the contract structure may help reduce the adverse selection problem and attract more capable recruiters as suggested by findings in other industries (Cornelissen, Heywood, and Jirjahn, 2011; Lazear 2000). This may very well further increase the productivity and reduce cost.

If the U.S. Navy were to implement piece-rate compensation, it bears keeping in mind that our survey was conducted at a time when the unemployment rate was high (about 6.7% nationwide), which may have made recruiters believe it was easier to obtain recruits than in a fully employed labor market. Furthermore, we do not know the extent to which our sample is a selected subsample of all recruiters, which could bias our results. Nevertheless, the estimated benefit-to-cost ratios are large enough that there is much room to give from any over- or under-estimate from this study.

There are several drawbacks to having piece-rate compensation, however. First, piece-rate compensation may incentivize recruiters to inflate the quality of otherwise ineligible candidate recruits (Government Accountability Office, 2006; Government Accountability Office, 2008). It is worth noting, however, the current quota scheme may also encourage misrepresentation. Second, piece-rate compensation could cause recruiters to compete against each other rather than work with each other. A potential solution may be to provide group piece-rate compensation although this may create other moral hazard problems. Third, the opportunity for earning bonuses would not be equal for all recruiters. Those in administrative jobs would not be eligible for them, and those in more difficult recruiting environments would likely have less opportunity to earn bonuses.[13] This may be remedied by indexing bonus amounts to the local supply of recruits. Finally, we received comments from survey respondents (consistent with reports we have heard) that many recruiters are morally opposed to a piece-rate compensation scheme because it may give an impression that recruiters are "salesmen" who are in it for themselves rather than for service to their country. But, our finding that 80% of the recruiter respondents said they would prefer the piece-rate compensation suggests that a relatively small percentage of recruiters are indeed morally opposed to such a compensation.

Finally, we are not dismissing the importance of symbolic or non-monetary awards as these can also increase performances in various environments (Bradler, Dur, Neckermann, and Non, forthcoming; Kosfeld and Neckermann, 2011). Our analysis is an add-on to the current system of the non-monetary compensation. In addition, our results suggest that time-off piece-rate compensation may be most effective.

[13] The Navy attempts to match the number of recruiters with the supply of potential recruits in order to equalize expected contracts-per-recruit; however, the distribution is not always uniform.

In light of the findings of this paper, we suggest that any recruiting force that implements a piece-rate compensation to first experiment with it before fully implementing. Carefully designed, randomized controlled trials could circumvent the possible problems mentioned above, and provide credible estimates of the incentivizing effects of piece-rate compensation, and their associated cost-savings.

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Figure 1. The incentivizing effects of non-monetary incentives.

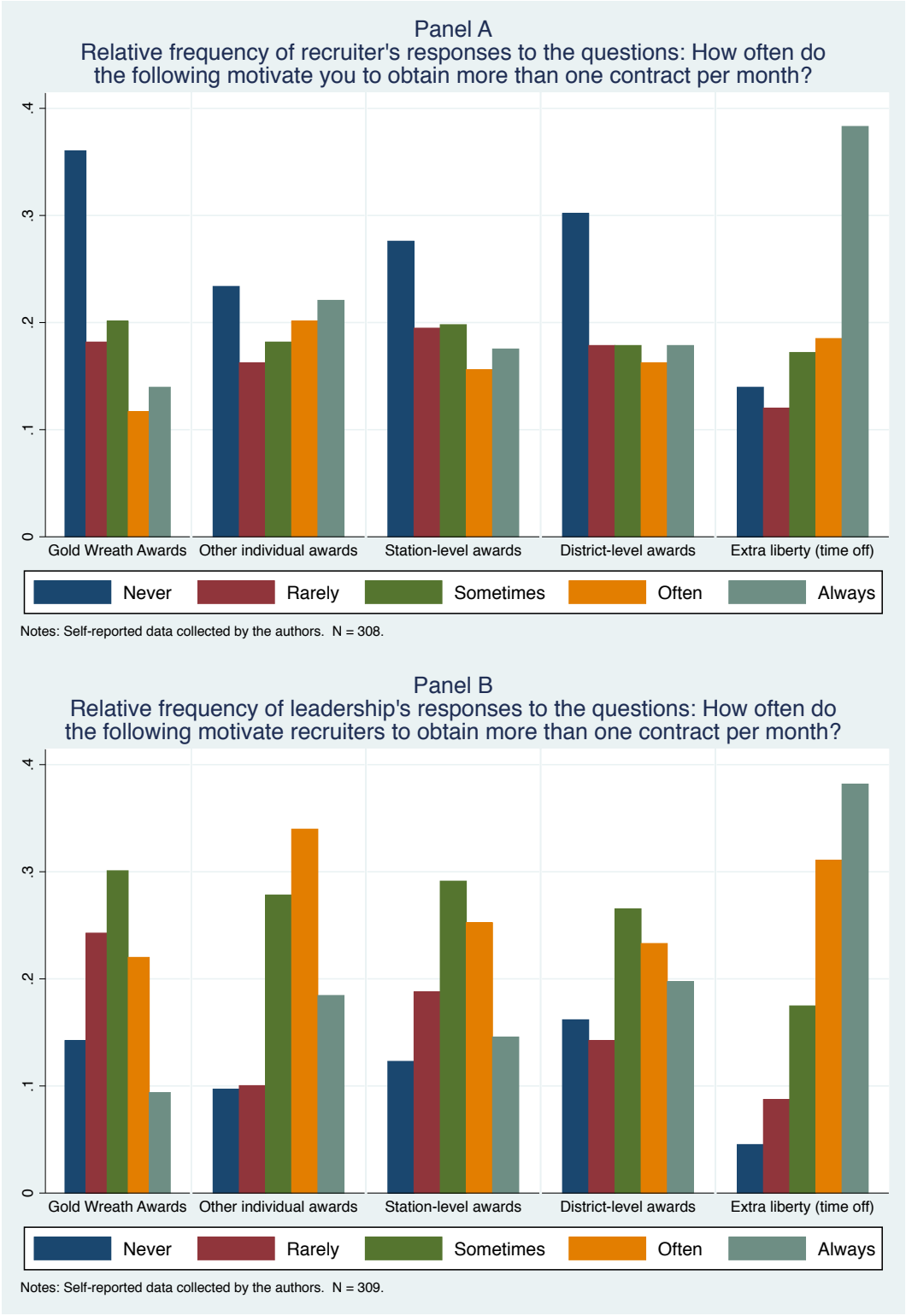

Table 1. The percentage of recruiters preferring a particular piece-rate bonus per contract.

Bonus offered per contract	Implied # of monthly contracts required to break even with the status quo	Percent of respondents choosing the per-contract scheme	Cumulative percentage
	(1)	(2)	(3)
$50	4	14.4%	14.4%
$100	2	31.0%	45.4%
$150	1.33	6.5%	52.0%
$200	1	12.7%	64.7%
$250	0.8	3.9%	68.6%
$300	0.67	11.1%	79.7%

Notes:

(1) The piece-rate bonus schemes include the offered piece-rate bonus per contract and a flat rate bonus (SDAP) of $250 per month; the status quo is no piece-rate bonus and a flat rate bonus (SDAP) of $450 per month.

(2) Contracts refer to net high-quality contracts (see text).

(3) The total number of respondents is 308.

Table 2. Cost analysis of various piece-rate bonus schemes.

	Status Quo (no bonus per HQ contract, $450 monthly SDAP)	$50 bonus per HQ contract, $250 monthly SDAP	$100 bonus per HQ contract, $250 monthly SDAP	$150 bonus per HQ contract, $250 monthly SDAP	$50 bonus per HQ contract, $450 monthly SDAP
	(1)	(2)	(3)	(4)	(5)
Total # of recruiters required per year	3825	2806	1917	1849	2806
# preferring $50 bonus over the status quo	--	404	276	266	404
# preferring $100 bonus over the status quo	--	--	594	573	--
# preferring $150 bonus over the status quo	--	--	--	120	--
# not preferring any bonus over the status quo	--	2402	1047	890	2402
Annual labor costs of recruiting personnel					
Cost of piece-rate bonus payments	--	$1.7 M	$3.4 M	$5.1 M	$1.7 M
Cost of flat salary and benefits	$317.6 M	$233.0 M	$159.2 M	$153.5 M	$233.0 M
Cost of SDAP payments	$18.9 M	$7.7 M	$5.3 M	$5.1 M	$13.9 M
Total compensation costs to recruiters	$336.5 M	$242.4 M	$167.8 M	$163.7 M	$248.6 M
Cost savings versus status quo	--	$94.1 M	$168.7 M	$172.8 M	$88.0 M

Notes:

(1) We assume the Navy must hire enough recruiters to recruit 33,765 sailors per year under all payment schemes.

(2) The number of recruiters preferring various amounts over the status quo reflect the percentages presented in Table 1.

(3) SDAP (Special Duty Assignment Pay) is a flat-rate compensation received by recruits independently of the number of contracts signed. HQ = High quality.

(4) We assume the cost of flat salary and benefits for one recruiter is a $83,029 (see text).